

EMCO® & EMCO-Simplatroll®

making machines friendly

The brands **Emco** & **Emco-Simplatroll** stand for uncompromised quality in products as well the services. Products that are safe & reliable and service that makes our products and your machines perform efficiently.



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(Formerly Emco Lenze Pvt. Ltd.)

CIN NO.: U74999MH1991PTC061109

Website: www.emco-dynatorq.in

EMCO-Simplatroll®

Electromagnetic Brakes & Clutches







Type 14.105
Flange & Shaft Mounted Clutches
(Normally OFF)





Emco Simplatroll DC Electromagnetic **Brakes** (Flange Mounted) and **Clutches** (Flange & Shaft Mounted) are designed for high consistent operating characteristic with a torque range of 7.5-2500 Nm. They are available in 3 different designs to stop/connect the drive or load side either shaft, pulley and sprocket. They are maintenance free and provided with a unique pre-stressed spring made from German spring steel and a coil with class 'F' insulation to give million of operations without fatigue.

Salient Features of **Type 14.115**

- ► Torque : 75 Nm to 2500 Nm
- ► Single Plate Dry Type
- Zero Backlash
- Residual-free
- ► Fast Switching Times
- ▶ High Operating Reliability
- ▶ High Operating Frequency
- ► Compact Dimensions
- ► Simple Construction
- Maintenance Free
- Long Life
- Unique Pre-stressed Spring
- ► Coil with Class 'F' Insulation#
- Stationery Field (No Slip Rings)
- Non Asbestos Special Friction Material*
- Consistent Operating Characteristics
- ► Simple Wear Compensation Adjustment
- ► Simple Installation
- ► Low Inertia of Rotating Parts
- ▶ No Restriction on Mounting Position

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- ► Torque : 75 Nm to 2500 Nm
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- Compact Dimensions
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- ▶ Long Life
- ► Unique Pre-stressed Spring
- Stationery Field (No Slip Rings)
- ► Consistent Operating Characteristics
- ► Simple Wear Compensation Adjustment
- ► Coil with Class 'F' Insulation#
- Asbestos-free Friction Materials*
- ► Simple Installation
- ► Low Inertia of Rotating Parts
- ▶ Raw Materials to DIN Standards
- ► No Restriction on Mounting Position

Higher coil insulation available on request. * Standard Indian liner. German liner available on request.

Applications



Cranes & Hoists



Machine Tools



Packaging Machines



Textile Machines



Wire Drawing Machines



Pharmaceutical Industry



Conveyors





Printing Machines Special Purpose Machinery Special Test Rigs



Type 14.115/112.1

Air Gap a

Design 3

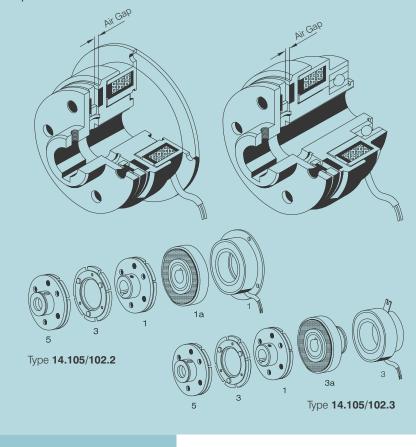
Prestressed Spring

Design 1

Components exploded view

Friction Material

Connecting Wires



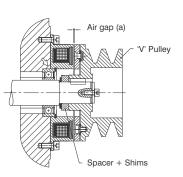
Type 14.105/102.2

Mounting

Hub / Flange

Armature Plate

Type **14.115**



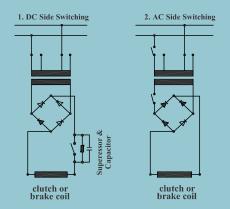
Combination of the 115-1.3 and 'V' Pulley

Working

Type **14.115**

When supplied with DC voltage the armature is attracted towards the friction material of the rotor and transmits the torque free of back-lash. When the supply is interrupted, the pre-stressed spring pulls the armature back into its original position free of residual torque even when mounted vertically.

Switching



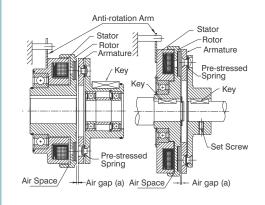
Our Brakes & clutches require DC supply voltage which is obtained through AC/DC rectification. Normally switching is carried out on the AC side.

However, for much faster engagement /disengagement time switching is carried out on the DC side for which a suitable arc suppressor and a capacitor is a must to protect the coil, switches etc. from high induction voltages produced during switching off power supply.

Engagement /disengagement time is a function of nominal release distance (airgap) and type of switching.

Mounting

Type **14.105**

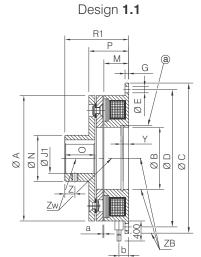


Structure of the Bearing mounted type (105 model)

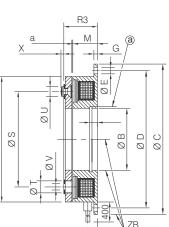
Working

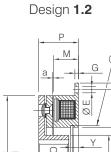
Type **14.105**

When supplied with DC voltage the armature is attracted towards the friction material of the stator and the friction causes the rotating component to stop. When the supply is interrupted, the prestressed spring pulls the armature back into its original position free of residual torque even when mounted vertically.









Tapped holes shown on dimension 'Z' on request,

Parameters								All dimensions are in mm	
Size		06	08	10	12	16	20	25	
Torque M RAT. (Nm)		7.5	15	30	60	120	240	480	
Max Speed [min ⁻¹]		8000	6000	5000	4000	3000	3000	2000	
Input Power P20 [w]		11.5	16	21	28	38	45	70	
Inertia [kg cm²]	Armature $\frac{1/2}{3}$	0.6 0.42	1.71 1.18	6.64 4.72	18.0 13	63.3 48	190 137	480 358	
Permissible Misalignment	Zw (mm)	0.08	0.08	0.08	0.1	0.1	0.1	0.15	
	ZB (mm)	0.2	0.2	0.2	0.2	0.3	0.3	0.3	
I	ØA	63	80	100	125	160	200	250	
Important : • Standard voltages : 24 VDC; 96 VDC; 190 VDC	ØB H8	35	42	52	62	80	100	125	
	ØC h9	80	100	125	150	190	230	290	
	ØD	72	90	112	137	175	215	270	
(Other voltages on request.) • P: Coil Power at 20° C	ØE	4 x 4.5	4 x 5.5	4 x 6.6	4 x 6.6	4 x 9	4 x 9	4 x 11	
	G	2	2.5	3	3.5	4	5	6	
• P : Coil Power at 20 C	M	18	20	22	24	26	30	35	
• Permissible voltage change +5% to -10%	ØN	27	32	42	49	65	83	105	
	O	15	20	25	30	38	48	55	
	P	25.5	28.5	32.9	37	42	50.4	58.9	
 Keyways to IS: 2048 wherever possible otherwise to DIN Standard @Circlip grooves to DIN 472 	R 1	37	44.5	52.9	61	73	89.4	102.9	
	R 3	22	24.5	27.9	31	35	41.4	47.9	
	ØS	46	60	76	95	120	158	210	
	ØT	3 x 6.3	3 x 8	3 x 10.5	3 x 12	3 x 15	3 x 18	4 x 22	
Also available following Brakes Size Torque 31 630	ØU	3 x 5.5	3 x 7	3 x 9	3 x 10	3 x 13	3 x 16	4 x 20	
	ØV	3 x 3.1	3 x 4.1	3 x 5.1	3 x 6.1	3 x 8.2	3 x 10.2	4 x 12.2	
	X	1.4	1.7	2.1	2.5	3	4	4.3	
40 1250	Y	3.5	4.3	5	5.5	6	7	8	
50 2500	Z	5	6	6	10	10	15	20	
Please call us for more details.	a	0.2	0.2	0.2	0.3	0.3	0.5	0.5	
	b	6.3	6.3	6.3	6.8	8.8	12.4	14.9	
* pilot bore, no keyway	ØJ ₁ ^{H7} **	10	10	14	14	20	25	25	
** Standard bores		10,12,15	15,17, 20	20, 25, 28	25, 28, 30	30, 35, 40	40, 50, 55	40, 50, 60	
*** Max. bores		17	20	30	35	42	60	60	

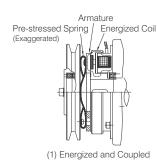


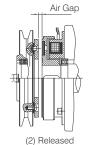
Pre-stressed Spring before installation

Pre-stressed Spring

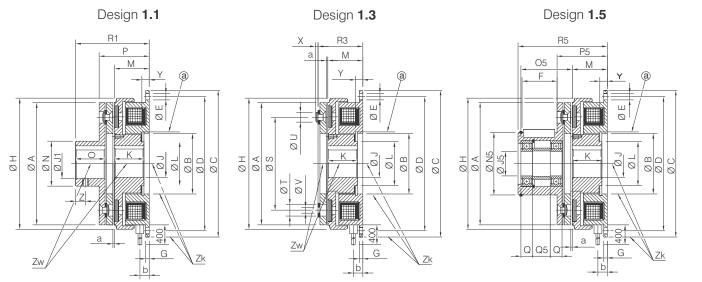
This is a ring shaped thin plate spring of simple construction. Tens of millions of ON-OFF operations will not cause permanent set in fatigue or cracking. Nor will it be broken by rust or erosion, being fabricated out if special steel material.

It is pre-stressed and of a special WVE shape design, providing strong spring force that is durable against long-term use, and stable performance.





Operation of Clutch

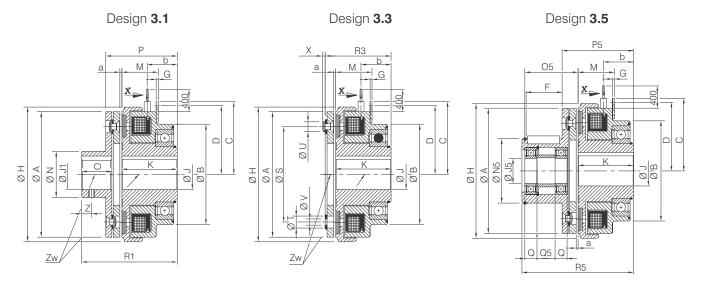


Tapped holes shown on dimension 'Z' on request,

Parameters All dime								All dimensio	ns are in mm		
Size					06	08	10	12	16	20	25
Torque	M RAT. (Nm	1)			7.5	15	30	60	120	240	480
Max Speed	[min ⁻¹]	<u>, </u>			8000	6000	5000	4000	3000	3000	2000
Input Power	P20 [w]				15	20	25	35	50	68	85
1000		Rotor			1.19	2.66	7.8	22.6	63	205	547
	.		1		0.6	1.71	6.64	18	63.3	190	480
Inertia	[kg cm ²]	Armature	3		0.42	1.18	4.72	13	48	137	358
		7 WITHALAIC	5		0.92	2.82	9.2	25.8	86.8	258	720
			Zw (mm)		0.05	0.05	0.05	0.05	0.1	0.1	0.1
Permissible	Misalignmen		Zw (mm)		0.03	0.05	0.05	0.03	0.1	0.1	0.25
			. ,					-	-	-	
			ØA ØB H8		63 35	80 42	100 52	125 62	160 80	200	250 125
Importar	π:		ØC h9		80	100	125	150	190	230	290
 Standard 	voltages:										
	96 VDC; 190	VDC	ØD ØE		72 4 x 4.5	90 4 x 5.5	112 4 x 6.6	137 4 x 6.6	175 4 x 9	215 4 x 9	270 4 x 11
(Other vo	Itages on rec	juest.)	F		4 X 4.5 17	22	27	36.5	44.4	53.4	83.5
			G		2	2.5	3	3.5	4	5	6
• P : Coll P	ower at 20° C	,	ØH		68	2.5 85.5	107	134.3	170	214.3	266.5
 Permissib 	ole voltage ch	ange	ØJ ₂		12	15	20	25	30	40	45
+5% to -	_	· ·	K		22	24	27	30	34	40	47
			ØL		23	28.5	40	45	62	77	100
• (*) J : 55	& 60		M		24	26.5	30	33.5	37.5	44	51
• J ₁ : 55			ØN _{sk6}		27	32	42	49	65	83	105
			ØN ØN		38	45	55	64	75	90	115
 @Circlip 	grooves to D	IN 472	0		15	20	25	30	38	48	55
 Kevwavs 	to IS : 2048 v	vherever	0,		22.7	32.2	39.4	51.5	63	77.9	91.9
		DIN Standard	P		31.5	35	40.9	46.5	53.5	64.5	74.9
			P ₅		31	35	40.9	46.5	53.5	65.4	74.9
	lable_followin	g Brakes	Q		8	9	12	12	13	15	19
Size	Torque		Q ₅		4	5.5	6.5	18	28	34	38
31	630		R ₁		43	51	60.9	70.5	84.5	103.4	118.9
40	1250		R ₃		28	31	35.9	40.5	46.5	55.4	63.9
50	2500		R ₅		51	60	70.9	86.5	103.5	125.4	144.9
• Please c	all us for mo	re details	ØS		46	60	76	96	120	158	210
1 10000 0	un uo 101 1110	oro dotalio.	ØT		3 x 6.3	3 x 8	3 x 10.5	3 x 12	3 x 15	3 x 18	4 x 22
			ØU		3 x 5.5	3 x 7	3 x 9	3 x 10	3 x 13	3 x 16	4 x 20
			ØV		3 x 3.1	3 x 4.1	3 x 5.15	3 x 6.1	3 x 8.2	3 x 10.2	4 x 12.2
			X		1.4	1.7	2.1	2.5	3	4	4.3
			Υ		3.5	4.3	5	5.5	6	7	8
			Z		5	6	6	10	10	15	20
			a		0.2	0.2	0.2	0.3	0.3	0.5	0.5
			b		5.7	6.5	7.9	7.1	9.1	12.4	14.9
			C 1 ^{L17}	*	10	10	14	14	20	25	25
			ØJ ^{H7}	**	11,14,15 17	14,19, 20 22	19, 24, 28 30	24, 34, 38 40	28, 38, 42 50	38,42, 48 65	50, 60, 70 80
	* pilot bor	e, no keyway									
	** Standard		ØJ, H7	*	10 11,12,14	10 14,17,19	14 19, 24, 28	14 25, 28, 34	20 28, 34, 38	25 38, 42, 48	25 40, 50, 60

Type 14.105 (Normally OFF)

Dimensions

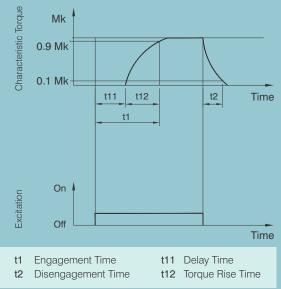


Tapped holes shown on dimension 'Z' on request,

Parameters ,							All dimensions are in mm		
Size			06	08	10	12	16	20	25
Torque M RAT. (N	m)		7.5	15	30	60	120	240	480
Max Speed [min ⁻¹]			8000	6000	5000	4000	3000	3000	2000
Input Power P20 [w]			15	20	25	35	50	68	85
	Rotor		1.33	2.94	8.66	24.6	69	215	566
Inertia [kg cm²]		1	0.6	1.71	6.64	18	63.3	190	480
inortia [ng ciri]	Armature	3	0.42	1.18	4.72	13	48	137	358
		5	0.92	2.82	9.2	25.8	86.8	258	720
Permissible Misalignme	nt	Zw (mm)	0.05	0.05	0.05	0.05	0.1	0.1	0.1
luon autamt .		ØA	63	80	100	125	160	200	250
Important :		ØB C	64	68 50	85	100 72.5	127 99	151.5 119	152.4 145
 Standard voltages : 			41		61				-
24 VDC; 96 VDC; 19		D E	37	46	57	68.5	93 8.1	113	139
(Other voltages on re	equest.)	E.	4.1 10	4.1 12	4.1 14	4.1 14	20	8.1	8.1 20
• P : Coil Power at 20°	С	F	17	22	27	36.5	44.4	53.4	63.5
- Darminaible valtage	hanaa	G	1.5	1.5	2.5	2.5	3.5	3.5	3.5
 Permissible voltage of +5% to -10% 	cnange	ØH	68	85.5	107	134.3	170	214.3	266.5
@Circlip grooves to DIN 472 Keyways to IS: 2048 wherever possible otherwise to DIN Standard		K	40	43.5	49	55	61.5	74	81
		M	26	28	32.5	36	41.7	48.1	55.2
		ØN	27	32	42	49	65	83	105
		ØN₅K ₆	38	45	55	64	75	90	115
·		O O _E	15 22.7	20 32.2	25 39.4	30 51.5	38 63	48 77.9	55 91.9
 Also available following Size Torque 		P P	47.5	52.2	60	68	77.5	94.4	105
31 630		P ₅	47.5	52	60	68	77.5	95.4	105
40 1250		Q	8	9	12	12	13	15	19
50 2500		Q	4	5.5	6.5	18	28	34	38
		R,	59	68	90	92	108.5	133.5	149
 Please call us for mo 	re details.	R ₃	44	48	54.9	62	70.5	85.4	93.9
		R₅	67	77	90	108	127.5	155.4	175
		ØS ØT	46 3 x 6.3	60 3 x 8	75 3 x 10.5	95 3 x 12	120 3 x 15	158 3 x 18	210 4 x 22
		ØU	3 x 5.5	3 x 7	3 x 9	3 x 10	3 x 13	3 x 16	4 x 20
		ØV	3 x 5.5 3 x 3.1	3 x 4.1	3 x 5.15	3 x 10 3 x 6.1	3 x 13	3 x 10.2	4 x 20 4 x 12.2
		X	1.4	1.7	2.1	2.5	3	4	4.3
		Z	5	6	6	10	10	15	20
		а	0.2	0.2	0.2	0.3	0.3	0.5	0.5
		b	22	24	27.5	29.5	35	42.5	45.5
		ØJ ^{H7} **	10,15	17, 20	20, 25, 30	20, 25, 30	25, 30, 40	38,42, 48	40, 45, 50
		ØJ ***	20	25	30	40	50	65	60
* pilot k	oore, no keyway	*	10	10	14	14	20	25	25
** Stand	lard bores	ØJ ₁ ^{H7} **	10,12,15	14,17, 20	20, 25, 28	25, 28, 30	25, 28, 40	40, 45, 50	40, 50, 60
*** Max.		***	17	20	30	35	45	60	80
		$ØJ_5^{H7}$	12	15	20	25	30	40	45

If clutch is engaged at 0 RPM, torque will be 30% - 35% than the rated torque

Operating Times*



*	Average	times	measured	with	rated	air-gaps.

14.115	14.115									
Brake Size	t11ms	t12ms	t1ms	t2ms						
06	10	20	35	10						
08	15	25	40	20						
10	20	40	60	30						
12	25	55	80	45						
16	30	70	100	60						
20	35	80	115	70						
25	40	90	130	80						

14.105								
Clutch Size	t11ms	t12ms	t1ms	t2ms				
06	15	30	45	10				
08	20	55	75	15				
10	25	85	110	25				
12	35	105	140	40				
16	45	125	170	50				
20	60	140	200	60				
25	75	155	230	70				

Selection

1. Select basic brake according to the torque.

Torque (Nm) = 9550 X (Motor kW / RPM) X Safety factor (K)

Load Condition	Safety Factor (K)
Low masses, equal loading & non - intermittent operation	2.0
Low masses, light shock load & intermittent operation	2.5
Medium masses, light shock load & intermittent operation	3.0
Large masses, light shock load & intermittent operation	3.0
Diesel engine drive	4-5
Compressor drive	5-6
Non overhauling Loads	2-3
Overhauling Loads	3-4

- 2. Describe the brake with the ordering parameter. (Type, size, operating voltage and hub bore)
- 3. Choose optional extras required (G pcd, tacho mounting provision, friction plate (instead of mounting flange), with microswitch).
- 4. Choose appropriate safety factor for the hoist, lift, inclined conveyors or equipment where holding against gravity is required.
- 5. Select proper Rectifier considering rated voltage of the brake. If coil operating voltage is 96 or 190 VDC you can use our rectifier (Call for product details).
- 6. Choose correct input AC voltage for rectifier.

Life

The life of friction liner depends on number of factors like, the inertia to be retarded or stopped, the relative speed, the operating frequency. the temperature at the friction surface etc. This brake must run dry. Oil, grease foreign materials, similar such lubricant affects the life and characteristics of friction materials. No general statement can be made about the life of friction materials.